

BREAST CANCER SCREENING IN NIGERIA: EVALUATING PRACTICES,
BARRIERS, AND PROSPECTS

A Thesis

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ABSTRACT

Background: Breast cancer incidence in low and middle income countries continues to rise while outcomes remain poor. Early detection through screening has been recognized as an important factor for improving outcomes. Currently, there are no organized breast cancer screening programs in most low and middle income countries, Nigeria inclusive. In designing one, it is imperative to understand current screening practices, and barriers to screening. Also important, is the need to evaluate the prospects of a screening program given the limited resource capability and the possible impact of socio-cultural factors on the uptake of screening.

Methods: Women, 40 years and older in Ife central and Iwo local governments in South-western Nigeria were surveyed. Ife central has a Teaching Hospital which offers mammography services while Iwo which is 32 miles away does not. Interviewers administered a 35 item questionnaire to assess socio-demographic information, breast cancer knowledge, mammography screening practices, reasons for not undergoing mammography and ability to pay for mammography. In addition, screening practices in the two communities were compared to assess the impact of access on uptake.

As an initial step the prospects of a CBE based screening program in Ife-Central local Government was assessed. CBE practice as well as perceptions and preferences were evaluated.

Results: 2222 women were interviewed, 1169(52.6%) in Ife and 1053(47.4%) in Iwo, most between ages 40-49 years. The majority had heard of breast cancer (Ife 94%, Iwo 97%), but few were aware of mammography as a breast cancer screening tool (Ife

11.8%, Iwo 11.4%). Mammography uptake in Ife was 2.8% and 1.8% in Iwo, despite Ife having mammography services geographically accessible and 20% reporting they could afford annual mammography at the present cost. Knowledge and practice of mammography were not statistically different between the two communities ($p = 0.74, 0.1$). Lack of awareness was the reason for not undergoing mammography in the majority while only 20% reported they could afford annual mammography from both communities.

Of the 1169 women in Ife, only 19.7% have had a CBE, of which only 6% had it in the last year. The majority (65.4%), were willing to have regular clinical breast examination and did not care about the gender of the examiner in most instances. Lack of perceived need was the reason cited by women unwilling to participate.

Conclusion: Mammography screening practices are generally poor in spite of geographic access. Lack of awareness was cited as the principal barrier to screening, while cost may also be a potential limiting factor for many who are willing.

With the majority willing to have regular CBE, a carefully designed CBE program coupled with advocacy to correct uneducated beliefs seems promising.

BIOGRAPHICAL SKETCH

Olalekan Olasehinde received his medical training at the Obafemi Awolowo University Ile-Ife, Nigeria in 2005. He completed his residency training in surgery at the Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC) in 2013. He is a fellow of the West African College of Surgeons and the National Postgraduate Medical College of Nigeria. He is currently a lecturer at the department of surgery of the OAU and a consultant general surgeon at the OAUTHC.

Dr Olasehinde's research focusses on improving breast cancer outcomes in Nigeria through early detection and improved care.

I dedicate this project to my Lord and Savior Jesus Christ, my strength, my source of inspiration, wisdom, knowledge and understanding. He has been the source of my strength throughout this program. I also dedicate this work to my dear wife and friend, Oluwabunmilomo and to my two wonderful boys, Victor and Daniel who provided me all the support I needed to successfully complete this program.

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CHAPTER ONE

BREAST CANCER SCREENING UPTAKE IN TWO COMMUNITIES WITH
DIFFERENTIAL ACCESS TO MAMMOGRAPHY FACILITIES

ABSTRACT

Background: Breast cancer incidence in low and middle income countries is rising while outcomes remain poor. Measures to promote early detection are therefore much required. This study evaluates barriers to mammography screening and examines the impact of geographic access to a mammography facility on screening uptake in two Nigerian communities.

Methods: Women, 40 years and older in Ife central and Iwo local governments in Southwestern Nigeria were surveyed. Interviewers administered a 35 item questionnaire to assess socio-demographic information, breast cancer knowledge, mammography screening practices, reasons for not undergoing mammography and ability to pay for mammography. The two communities were compared.

Results: 2222 women were interviewed, 1169 (52.6%) in Ife and 1053(47.4%) in Iwo, most between ages 40-49 years. Most had heard of breast cancer (Ife 94%, Iwo 97%), but few were aware of mammography as a breast cancer screening tool (Ife 11.8%, Iwo 11.4%). Mammography uptake in Ife was 2.8% and 1.8% in Iwo, despite Ife having mammography services geographically accessible and 20% reporting they could afford annual mammography at the present cost. The knowledge and practice of mammography were not statistically different between the two communities ($p= 0.74, 0.1$). Lack of awareness and lack of perceived need were the most common reasons for not undergoing mammography.

INTRODUCTION

Breast cancer is more commonly diagnosed in high income countries; however, low and middle income countries (LMIC) report increasing incidence and higher mortality, a trend projected to continue over the next decades¹. In Nigeria, breast cancer is the most common female malignancy² and most women present with advanced diseases³⁻⁶, it is therefore not surprising that it is one of the leading causes of cancer death⁷.

Breast cancer five year survival in Nigeria ranges from about 11-25% compared to 90% in the US^{8, 9, 10} a difference attributed to widely available treatment and early detection through screening¹¹. In most low and middle income countries, radiation therapy and chemotherapy are not widely available or are unaffordable. Surgical treatment remains the most common treatment with chemotherapy, when affordable^{12, 13}. Improving adjuvant treatment availability would be ideal; however, maximizing the benefit of surgical treatment through early diagnosis should be the initial focus given surgery is cheaper and more widely available¹⁴.

Mammography while not widely available in Nigeria, can be found in cities and tertiary hospitals. Nigeria and other low resource countries report very low mammography uptake¹⁵⁻¹⁸. Cost may be a barrier¹⁹ given the fact that health costs in Nigeria are largely out of pocket with less than 5% of the population covered by the National Health Insurance Scheme²⁰. Other factors are likely to contribute to poor mammography uptake given other forms of inexpensive or free screening demonstrate similarly poor uptake^{18, 21}. Reasons for poor mammography utilization in places with geographic access have not been comprehensively studied. These data are key to promoting screening. This study aims to determine the impact of geographic access on mammography uptake and to identify barriers to mammography uptake, in two communities in Southwestern

Nigeria, information essential for planning effective breast cancer screening and interventional programs.

METHODS

Study design and study population

From February-April 2016, women 40 years and older were surveyed in Ife central and Iwo local government. The two communities are located in the Southwestern part of Nigeria, about 32 miles apart. Ife central local government is one of two local government areas in Ife, with a population of 167,254 people (2006 census figures). Ife has a University with an affiliated Teaching Hospital offering surgical and radiological services including mammography. Iwo with 191,348 people, also has a University, but only district hospitals without mammography services.

The minimum required sample size of 1152 was calculated based on an estimated 3% mammography screening rate from a previous study at a confidence level at 95% and a margin of error set at 1% (0.01). Participants were women 40 years and older, selected from 15 wards in Iwo and 11 wards in Ife central local governments, using multistage sampling from the wards to the streets. Because of social characteristic variations all wards were sampled for equal representation. The number of women sampled from each ward was proportional to the fraction of the population the ward represented.

Instrument

A 35 item study specific interviewer administered questionnaire was utilized, first designed in English and later translated to Yoruba, the local language in Ife and Iwo, by a Yoruba language education expert. Pre-testing of 20 women in Ife was done in both languages with subsequent survey revision before final adoption. Ten minute interviews

were conducted by trained undergraduate and graduate students. Interviewers fluent in English and Yoruba had the questionnaire available in both languages with participants interviewed in their preferred language. The questionnaire gathered demographic characteristics, knowledge and experience about breast cancer, knowledge and practice of mammography, reasons for not undergoing mammography and other health behaviors.

Key variables

Study key variables were awareness of mammography, practice of mammography and reasons for not having mammography. Awareness of mammography was defined as knowledge of its existence as a breast cancer screening modality while practice of mammography was defined as having had a mammogram in the past.

Statistical analysis

Data was stratified based on location (Iwo and Ife) and descriptive statistics used to present socio-demographic characteristics, knowledge of breast cancer, practice of breast cancer screening and other key variables. Comparisons were made between Ife and Iwo based on the key outcome variables- awareness and practice of mammography using chi-square test.

Factors associated with mammography uptake were assessed using simple and multivariate Poisson regression with robust variance estimation used to derive prevalence ratios with 95% confidence interval. Item selection for the multivariate regression was by backward elimination method in which a p-value of 0.25 was set as the level for removal from the model.

Ethics

Approval from the ethical committee of the Institute of public health of the Obafemi Awolowo University Ile-Ife and from Ife Central and Iwo Local government area authorities was obtained before survey administration.

RESULTS

2,222 women were interviewed, 1169 (52.6%) from Ife and 1053 (47.4%) from Iwo. 26 women declined to be interviewed, for reasons such as their experience with breast cancer, fear of contracting cancer, lack of concern about it, or lack of time.

Most participants were in their forties, with those from Ife slightly older than those from Iwo (Mean 49.13 ± 10.45 years versus 47.95 ± 8.79 , Table 1). The majority had some form of education, with the largest percentage (819/2222, 36.9%) completing secondary education with a significant difference between those with primary and secondary education ($p=0.01$). Occupational distribution differed, however petty trading was the predominant occupation in both communities (Table 1).

Table 1.1: Socio-demographic characteristics

	Ife (N =1169) Freq. (%)	Iwo (N = 1053) Freq. (%)	Total (N = 2222) Freq. (%)
Age group			
40 – 49	687 (58.8)	652 (61.9)	1339 (60.3)
50 – 59	266 (22.8)	261 (24.8)	527 (23.7)
60 – 69	140 (12)	100 (9.5)	240 (10.8)
>69	76 (6.5)	40 (3.8)	116 (5.2)
Marital status			
Married	980 (83.8)	870 (82.6)	1850 (83.3)
Single	15 (1.3)	15 (1.4)	30 (1.4)
Widowed	150 (12.8)	131 (12.4)	281 (12.6)
Separated	10 (0.9)	23 (2.2)	33 (1.5)
Undisclosed	14 (1.2)	14 (1.3)	28 (1.3)
Highest level of education			
None	182 (15.6)	180 (17.1)	362 (16.3)
Primary	230 (19.7)	279 (26.5)	509 (22.9)
Secondary	486 (41.6)	333 (31.6)	819 (36.9)
College	256 (21.9)	255 (24.2)	511 (23)
Not disclosed	15 (1.3)	6 (0.6)	21 (0.9)
Occupation			
Artisans	74 (6.3)	46 (4.4)	120 (5.4)
Traders	832 (71.2)	654 (62.1)	1486 (66.9)
Farmers	45 (3.8)	57 (5.4)	102 (4.6)
Civil servants	148 (12.6)	238 (22.6)	160 (17.4)
Others	70 (6)	58 (5.6)	128 (5.8)

Awareness of breast cancer

In both communities most women had heard of breast cancer (Table 2) although more in Iwo (97.2%) than Ife (94%) ($p=0.001$). Knowledge of someone with breast cancer was similar in both and the majority stated the persons they knew received medical treatment and had died (Table 2).

Table 1.2: Knowledge and experience of breast cancer

	Ife	Iwo	Total
	No (%)	No (%)	No (%)
Have you ever heard of breast cancer?			
Yes	1099 (94)	1024 (97.2)	2123 (95.5)
No	70(6)	29 (2.8)	99 (4.5)
Do you know anyone who has had breast cancer?			
Yes	319 (27.3)	306 (29.1)	625 (28.1)
No	850 (72.7)	747 (70.9)	1597 (71.9)
Did the person receive medical treatment?	Ife (N=319)	Iwo (N=306)	Total (N=625)
Yes	265(83.1)	246(80.4)	511 (81.8)
No	15 (4.7)	14 (4.6)	29 (4.6)
Don't know	39 (12.2)	46 (15)	85 (13.6)
What was the outcome in that person?			
Alive and well	60 (18.7)	67 (21.9)	127 (20.3)
Alive but sick	32 (10)	38 (12.4)	70 (11.2)
Dead	207 (64.5)	158 (51.6)	365 (58.2)
Don't know	22 (6.9)	43 (14.1)	65 (10.4)

General health behavior

The majority of women visit hospitals for healthcare, with a trend towards more hospitals visits in Iwo compared to Ife, (68.9% versus 63.8%, $p=0.052$).

Knowledge and practice of mammography screening

Breast cancer screening of any type had been recommended to 37.2% of Ife and 36.6% of Iwo respondents; however, only 138 women (11.4%) from Ife and 120 women (11.6%) from Iwo had ever heard of mammography. Only 33 women (2.8%) from Ife and 19 women (1.8%) from Iwo had undergone mammography at any time, the majority not within the last year. Knowledge and practice of mammography screening did not differ between the two communities (Table 3).

Table 1.3: Knowledge and practice of mammography

	Ife (N =1169) Freq. (%)	Iwo (N = 1053) Freq. (%)	Total (N = 2222) Freq. (%)	p value
Have you ever heard of mammography?				
Yes	138 (11.8)	120 (11.4)	258 (11.6)	p = 0.764
No	1031 (88.2)	933 (88.6)	1964 (88.4)	
Have you ever had mammography?				
Yes	33 (2.8)	19 (1.8)	52 (2.3)	p = 0.113
No	1136 (97.2)	1034 (98.2)	2170 (97.7)	
When did you last have mammography?				
Less than 1 year	7 (21.2)	4 (21.1)	11 (21.2)	p = 0.187
1 - 2 years	8 (24.2)	9 (47.4)	17 (32.7)	
Above 2 years	18 (54.5)	6 (31.6)	24 (46.2)	
Do you know where mammography can be done?				
Yes	96 (69.6)	33 (27.5)	129 (50)	p < 0.001
No	42 (30.4)	87 (72.5)	129 (50)	
How much does mammography cost?				
Underestimated	18 (13)	14 (11.7)	32 (12.4)	p = 0.046
Correctly estimated	21 (15.2)	6 (5)	27 (10.5)	
Overestimated	4 (2.9)	6 (5)	10 (3.9)	
Don't know	95 (68.8)	94 (78.3)	189 (73.3)	

Among those who had heard of mammography, a significantly higher number of women knew where mammography could be done in Ife (69.6%) compared to Iwo (27.5%, $p<0.001$). There were few women in both communities who correctly estimated the cost of mammography, 15.2% in Ife and 6% in Iwo ($p=0.04$). Poisson regression to determine factors associated with mammography screening showed that, practice of CBE (APR-6.36, $p<0.001$) and knowledge of someone with breast cancer (APR-1.75, $p=0.04$), were associated with increased uptake.

CBE is a screening modality available to both communities. More Iwo respondents reported having a CBE compared to Ife, 27.4% compared to 19.7%, ($p<0.001$). Among those who had a CBE, 40.8% of Iwo and 30.4% of Ife respondents ($p<0.001$) had the exam in the last year

Barriers to mammography screening

Overall lack of awareness was the most common reason for not having mammography (76.7%) followed by lack of perceived need (15.9%). Other reasons given include challenges locating a mammography facility, obtaining an appointment, cost, fear of test results and embarrassment. The same response pattern was observed in both communities (Figure 1).

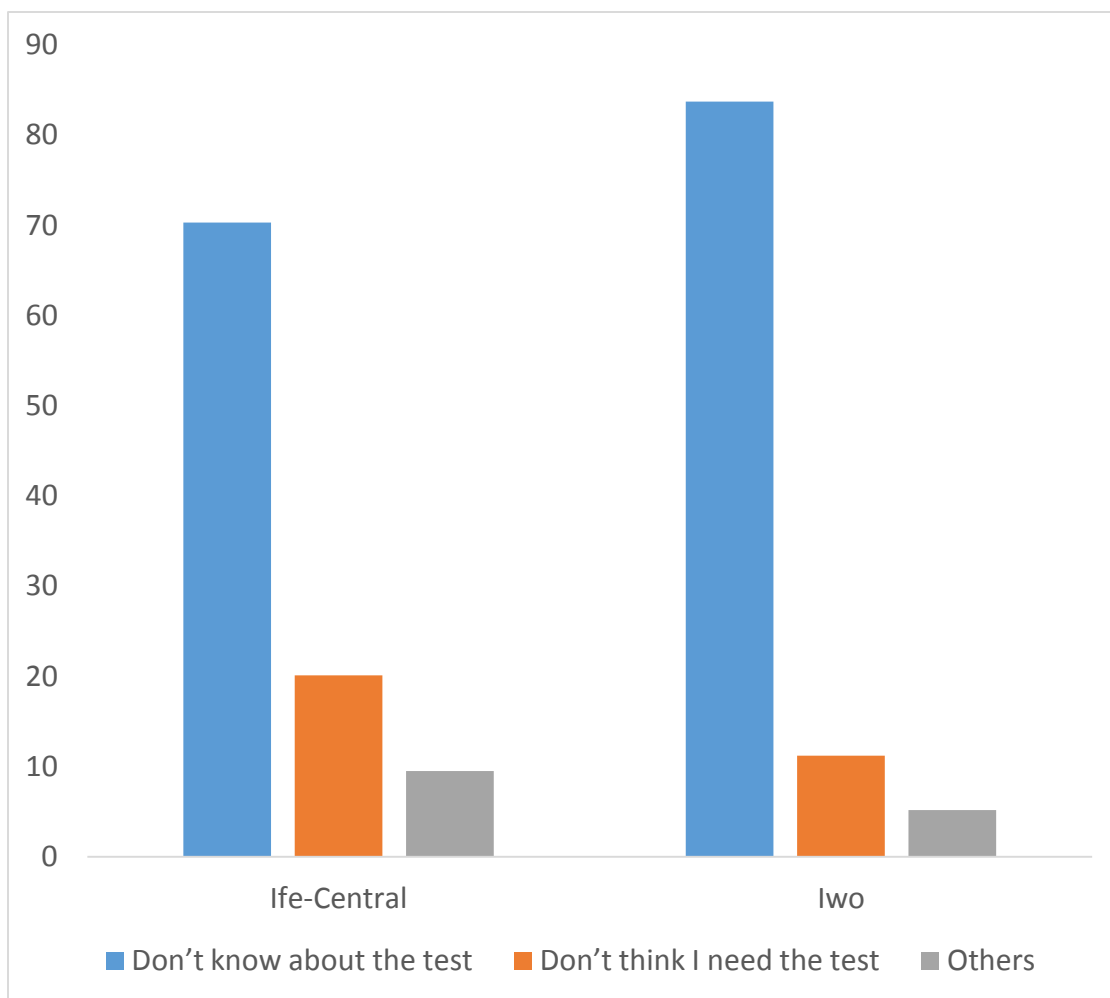


Figure 1: Most important reason for not having done mammography

Women were asked how much they could afford to pay for annual mammography. Of 1350 responses from both communities, 20.4% could afford annual mammography at the current price, 12.7% at half the price, 19% less than half the price while 47.9% could afford nothing.

DISCUSSION

Low and middle income countries face numerous barriers to quality health care including lack of facilities and resources²²⁻²⁴. While a challenge, the extent facility availability contributes to poor health indices may be exaggerated. It is imperative to understand factors affecting resource utilization, as examined in this study, to provide a rational basis for interventional program planning and help provide a foundation for optimal utilization of available health care facilities. This study shows poor utilization of mammography with poor awareness as the major contributing factor.

Ife central and Iwo local governments are comparable communities given similar demographics. Our study shows the two communities demonstrate similar breast cancer knowledge, with similar percentages having heard about breast cancer and knowledge of someone who had the disease. Our study depicts the personal experience of respondents: many they knew with breast cancer died despite medical care. This likely contributes to the belief that medical treatment offers little irrespective of disease extent. This belief affects patient attitudes toward early detection and must be addressed²⁵.

It is interesting to note that despite mammography service availability in Ife, 88.2% of Ife respondents were unaware of its existence. It is therefore not surprising that mammography uptake in Ife and Iwo were equally poor. This suggests that factors beyond geographic proximity contribute to low uptake. This is further confirmed by the relatively few number of women who had a CBE, which surprisingly was higher in Iwo where specialized services do not exist. Our study did make us aware of a community wide breast cancer awareness and CBE campaign conducted by a Non-Governmental Organization in Iwo General Hospital June 2013. This campaign may explain the higher Iwo CBE rates despite Ile-Ife having a teaching hospital with specialized breast care and more hospitals total.

In resource poor settings, many needs compete for funds. Given our results we recommend that breast cancer awareness and advocacy be given top priority in efforts against breast cancer. Community education and awareness programs should precede interventional programs aimed at increasing facilities to facilitate utilization of existing resources. Awareness campaigns should emphasize how stage at presentation affects breast cancer outcomes and the role of screening in early stage presentation. Awareness programs that feature testimonies from breast cancer survivors may be an effective approach to correct the erroneous belief that breast cancer always kills²⁶. Additionally, community education programs must address the lack of perceived breast cancer risk. This may require tailored approaches taking into account religious and cultural factors which underlie such beliefs²⁷.

While creation of awareness and community outreach programs should be the starting point, sustainability for continued practice depends on breast cancer screening programs. As in most LMIC, such programs do not exist in Nigeria²⁸. This deficiency contributes to poor screening rates and poor breast cancer outcomes.

In developing a breast cancer screening program, various expert recommendations have been made which are applicable in Low and middle income countries, depending on available resources²⁹⁻³². These recommendations, particularly at the basic and limited levels, can serve as a template to develop programs adaptable to each locality. The potential effect of cost is an important consideration in the development of any program. As awareness increases, other barriers such as cost may become more pressing^{33, 34}. It will then be of no benefit creating awareness when financial access is not guaranteed. In this study, we assessed the potential impact of cost on mammography uptake by asking how much each respondent could afford for annual mammography. Although 20% of respondents stated they could afford annual mammography at the current price,

it is striking that only 2.8% have had screening. A biennial screening program may improve affordability by decreasing overall cost; however there will remain many women requiring financial assistance to have mammography. Given the prevailing economic situation in most LMIC, this may not happen soon. As such there may be a need to selectively recommend mammography to high risk women who are most likely to benefit and advocate CBE for the majority of women. Successful CBE programs in certain LMICs provides a rational basis to consider its adoption³⁵⁻³⁷. A selective mammography screening program targeting women at high risk may create a demand more commensurate with screening services available to avoid overwhelming limited personnel and facilities³⁸.

We conclude that geographical access to a mammography screening facility has no influence on screening practices in the study population. Awareness and attitude are the most common reasons attributed to non-screening while cost is a potential limiting factor for some. An action plan to improve awareness and ensure optimal utilization of available resources with a carefully designed breast cancer screening program are urgently required.

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CHAPTER TWO

DEVELOPING A CLINICAL BREAST EXAMINATION BASED SCREENING PROGRAM IN A LOW INCOME COUNTRY; EVALUATING CURRENT PRACTICES, PERCEPTIONS AND POSSIBLE BARRIERS.

ABSTRACT

Background: In low and middle-income countries (LMIC) like Nigeria, women present with advanced breast at an earlier age. Given the limited resources, development of screening programs that parallel resource capabilities of LMIC is imperative.

Objective: To evaluate the perceptions, practices and barriers to clinical breast examination (CBE) screening in a low resource community in Nigeria.

Methods: A cross-sectional survey of women, 40 years and above in Ife, South-West Nigeria using multi-staged sampling was performed. Information on socio-demographics, knowledge of breast cancer, screening practices, and willingness to participate in CBE screening was obtained using an interviewer administered questionnaire.

Results: A total of 1169 women whose ages ranged from 40-86 years with a mean age of 47.7 ± 8.79 years were interviewed. Of the 36% who had breast screening recommended to them previously, only 19.7% had an actual CBE. Of these only 6% had it in the last year. The majority (65.4%), were willing to have regular clinical breast examination and did not care about the gender of the examiner in most instances. Lack of perceived need was the reason cited by women unwilling to participate.

Conclusion: The majority of women were aware of breast cancer and knew it as a fatal disease. With the relatively encouraging number of those willing to be examined, a carefully designed CBE program coupled with advocacy to correct uneducated beliefs seems promising.

INTRODUCTION

Breast cancer is a common cause of cancer related deaths in most developing countries. Most cases presenting in advanced stages¹, with high mortality². Studies have shown a steady rise in the incidence of breast cancer in Nigeria from 15.3 per 100,000 in 1976 to 33.6 per 100,000 in 1992 to 52.1 per 100,000 in 2012^{3,4}.

In developed countries however, mortality from breast cancer has been on the decline in spite of the higher incidence of breast cancer compared to low income countries⁵. This is due to the near equal contribution of early detection through screening and effective treatment modalities⁶. Most developed countries have well organized breast cancer screening programs that recommend mammography on an annual or biennial basis for eligible women^{7,8}. In the United States, women with average risk of breast cancer are recommended to undergo annual screening mammography starting at age 45 years up to age 54 years after which they should transition to biennial screening or continue screening annually. It is also recommended that women between ages 40 and 44 years should have the opportunity to begin annual screening⁸.

This has encouraged early presentation with concomitant improvement in outcomes compared to developing parts of the world⁹. The applicability of mammography based screening programs is however limited in low and middle income countries, due to the challenges of poor infrastructure, poverty and inadequate man power. Waiting until such capabilities are developed however, will lead to continued loss of life as a result of late presentation.

CBE has therefore been recommended as a screening modality that may find usefulness in resource poor settings while efforts are underway to attain the status of international best practices. Studies of programs in Africa and India¹⁰⁻¹² provide a strong rationale for

this assertion. The successes of these programs demonstrate the acceptability and feasibility for resource limited countries to develop formal programs at various levels of health care delivery that utilize clinical breast examination for screening either solely where mammography is unavailable or to complement mammography where it is in short supply.

This should, however, be done cautiously, given previous experiences where most participants failed to comply with the screening recommendations after commencement of the program¹³. As a first step in developing such a program, it is imperative to understand the peculiarities of the target community in order to conduct a successful, socially acceptable and sustainable program. This study, conducted in a South-Western Nigerian community, set out to determine the perceptions, practices and possible barriers of clinical breast examination as a first step in developing a screening program in a low resource setting.

METHODS

Study population

This study was conducted in the Ife central local government area of Osun State, South-Western Nigeria between February and April 2016. Ife central local government is one of the two local governments in Ile-Ife, a city in south-western Nigeria. It has a population of 167,254 (2006 census figures). It has a teaching Hospital where specialized care, including breast services, are offered.

The local government is made up of 11 wards, each having variable number of streets. Considerable variations exist in the social characteristics of the various wards, hence we sampled on all the wards for equal representation. Sampling was done using a multistage stratified sampling technique first into wards, and then into streets within each ward

across the local government, in order to obtain a representative sample of the entire community. The number sampled from each ward was proportional to the population size of the ward relative to the entire population.

Women 40 years and above were eligible for this cross-sectional survey which assessed the practice of clinical breast examination and the possible barriers to a clinical breast examination based screening program in Ile-Ife.

Instrument

We utilized a study specific interviewer administered questionnaire for this study. It was first designed in English and later translated to Yoruba, which is the local language in Ile-Ife. Translation was done by a Yoruba language education expert. Pretesting was done using both English and Yoruba versions in a cohort of 20 women in Ile-Ife and this was reviewed before its final adoption for the study. Interviews were conducted by a team of undergraduate and graduate students who were trained prior to commencement of the study. They could effectively communicate in both English and Yoruba languages and each interviewer had a copy of the questionnaire in both languages. Participants were interviewed based on their language preferences. Each interview lasted an average of 10 minutes. The questionnaire gathered information on demographic characteristics, knowledge and experience about breast cancer, practice of clinical breast examination, willingness to participate in a CBE program and possible barriers to participating in such a program.

Key variables

The key variables in this study were practice of clinical breast examination, willingness to participate in a regular clinical breast examination based program and reasons for refusal to participate.

We employed two measures of practice of CBE which are: ‘practice of CBE ever’ and ‘practice of CBE in the last one year’. Multiple responses were allowed for reasons for not having had CBE of which the most important according to each respondent was taken as the main reason for having not undergone CBE.

Statistical analysis

Socio-demographic characteristics, awareness of breast cancer, practice of breast cancer screening, willingness to participate in Clinical Breast Examination screening and other key variables were analyzed using descriptive statistics. Simple and multivariate Poisson regression with robust variance estimation was used to derive prevalence ratios with 95% confidence interval for the assessment of factors associated with willingness to participate in CBE. Variables selected for the multivariate Poisson regression was by backward stepwise elimination method with a p-value of 0.25 set as the level for removal from the model. Data analysis was done using STATA version 12.

Ethics

This study was approved by the ethical committee of the Institute of Public Health of the Obafemi Awolowo University Ile-Ife and approval was also obtained from the Ife Central Local government authority before the survey was conducted.

RESULTS

Sociodemographic characteristics

A total of 1169 women were surveyed across the entire local government. Their ages ranged from 40 to 86 years with a mean age of 47.7 ± 8.79 years. Most of the respondents had some form of education with only 15.6% having no formal education at all. Most were married and were traders as shown in Table 2.1.

Table 2.1: Socio-demographic characteristics

	(N=1169)	
	Freq	%
Age group		
40 – 49	687	58.8
50 – 59	266	22.8
60 – 69	140	12.0
>69	76	6.5
Marital status		
Married	980	83.8
Widowed	150	12.8
Single	15	1.3
Separated	10	.9
Undisclosed	14	1.2
Highest education level		
None	182	15.6
Primary	230	19.7
Secondary	486	41.6
College graduate	256	21.9
Undisclosed	15	1.3
Occupation		
Artisans	74	6.3
Traders	832	71.2
Farmers	45	3.8
Civil servants/Professionals	148	12.6
Others	83	7.1
Religion		
Christianity	876	74.9
Islam	281	24.0
Others	12	1.0

Knowledge and Experience of breast cancer

Most of the respondents (94%) had heard about breast cancer, while 27.5% knew someone who has had the disease. Amongst these, 82.5% claimed the persons they knew had received treatment in the hospital, and about two-thirds had died from the disease (Table 2.2).

Table 2.2: Knowledge of Breast Cancer

Have you ever heard of breast cancer?	No	%
Yes	1099	94.0
No	70	6.0
Do you know anyone who has had breast cancer		
Yes	321	27.5
No	848	72.5
Did the person receive medical treatment?		
Yes	265	82.5
No	15	4.7
Don't know	41	12.8
Total	321	100
What was the outcome in that person?		
Dead	207	64.5
Alive and well	60	18.7
Alive but sick	32	10
Don't know	22	6.8
Total	321	100
Do you think breast cancer can be cured medically?		
Yes	482	41.2
No	209	17.9
Don't know	478	40.9

General health behavior

Assessment of their general health behavior shows that, about two thirds of the respondents receive treatment for their health challenges in the hospital (63.9%), while

the others either self-medicate (19.2%), visit medicine stores (9.2%) or patronize herbalists (3.7%). Other health behaviors assessed include blood sugar test which had ever been done by only 42.8% while the remaining 57.2% have never had a blood sugar check. Pap smear for cervical cancer screening was done by 10.8% of the women while the majority (89.2%) have never had a pap smear.

Breast cancer screening practice

Specifically, with regards to breast cancer screening, the majority of women have never been screened by any method. Only 37.7% of the respondents had ever had breast cancer screening recommended to them. Of these, screening was recommended by a health worker in 43% of cases, mass media (37.8%), friends and relatives (13.6%), or religious and public seminars (5.6%). Regular self-breast examination was practiced by 31.2% of the women, while 23.5% claim to examine their breasts irregularly and 45.3% do not examine their breasts at all.

There were only 230 women (19.7%) who have ever had their breast examined by a health practitioner at any time. When asked when they last had such examination, only 6% of the 19% have had it in the last 1 year, 4.4% within the last two years and 9.2% have not had it in over 2 years.

Table 2.3: Breast cancer screening practices

	Freq.	%
Anyone recommended any method of early detection to you?		
Yes	441	37.7
No	728	62.3
How regularly do you examine your breasts?		
Monthly	365	31.2
Irregularly	275	23.5
Never	529	45.3
Ever had breast examined by a health practitioner(CBE)		
Yes	230	19.7
No	939	80.3
When was the last time you had CBE		
Within the last one year	70	6
More than 1 year	160	13.7
Never had a CBE	939	80.3
Attitude towards CBE screening programme		

With regards to willingness to participate in a regular breast examination programme, 765(65.4%) of the respondents were willing to participate in a regular breast examination screening programme while 404 (34.6%) were not. Lack of perceived need was the reason given for non-willingness by those who declined. Preference for gender of the examiner was sought and 249 (32%) would prefer a female examiner, 15 women (2%) preferred a male examiner while the majority (65.5%) do not care about the gender of the examiner. This was the case regardless of religion and level of education ($p=0.63$, 0.3 respectively). Prevalence ratio derived from Poisson regression with robust estimate

of variance showed that willingness to participate in CBE was significantly higher among women who were civil servants (APR-1.21, $p < 0.001$), who knew someone who had breast cancer (APR-1.15, $p \text{ value} < 0.001$), who practice regular SBE (APR-1.22, $p < 0.001$) and those who have had pap smear (APR-1.20, $p < 0.001$).

DISCUSSION

The current reality regarding the pattern of breast cancer presentation in most Low and middle income countries is disturbing. What is more worrisome, however, is the lack of an organized effort to control this trend. While the economic implications of adopting breast cancer standards are daunting, it is no excuse for the minimal efforts to date.

The use of clinical breast examination has been considered a surrogate for the standard screening modality in economically deprived countries and has been shown to produce good results⁵. As a means of translating this into practice, we embarked on this study to obtain necessary information that may assist in developing a viable, culturally acceptable screening programme. Our findings show that CBE uptake, though poor is acceptable to the majority of the women with very little social concerns.

Most of the respondents, who are women in their 40s, represent the population most affected by breast cancer in Nigeria and indeed most black populations¹. While mammography is generally recommended in most instances for women above 40 years, its benefit in terms of survival for women less than 50 years is controversial.^{14, 15}. As such, adopting a clinical breast examination based programme may not be out of place, at least until capabilities are developed for routine mammography. The fact that 94% of the respondents have heard about breast cancer is indeed a testimony to the relatively frequent occurrence of breast cancer in our society. What one wonders however, is the kind of knowledge that is entrenched in the social network, considering the fact that a

vast majority of those who knew someone with breast cancer, majority of whom received treatment in the hospital, claimed the persons they knew had died from the disease. The fact that less than half of the respondents believe breast cancer can be cured medically further solidifies the notion that is perhaps most widely believed about breast cancer which is that of uncertainty about its outcome or that of an invariably fatal disease irrespective of treatment. While most deaths are due to late presentation, they are usually attributed to failed treatment, thus perpetuating the idea that death is the inevitable consequence of breast cancer regardless of time of presentation or treatment. This is an aspect of community education that must be strongly addressed during awareness campaigns. Improvements in the outcome of breast cancer treatment will however be the most convincing evidence to correct this misconception.

With barely a third of women having ever had any form of breast cancer screening recommended to them, it is clear little is being done with regard to public advocacy. It is therefore not surprising that less than one fifth have ever had a clinical breast examination. In addition, the majority of these women had not been examined in the last year. Health workers certainly have a major role to play in creating breast cancer awareness and making screening recommendations to their contacts. As shown in this study, the majority of the recommendations were made by health workers. Contacts made with health personnel during visits to the hospital for various health challenges, can be utilized as a means of creating awareness and for opportunistic clinical breast examination screening. A link can also be created between breast health programs and other primary health programs such as maternal and child health services thereby utilizing such existing platforms for screening. This leverages on already existing infrastructure without creating a separate programme that requires mobilization of resources specifically for breast cancer. This is a cost effective design in resource

constrained settings where the incidence of breast cancer is not high enough for a cancer detection rate that justifies the investment of huge amount of resources on a vertical programme. Such an approach has also been favored by other breast cancer experts¹⁶. Combination of breast and cervical cancer screening is another approach that can be utilized as a cost effective and more comprehensive screening programme for women. This has also been successfully practiced with some good results¹¹. Training of personnel to effectively carry out breast examinations is key to the success of such a program, and this has been demonstrated by interventional programs that have utilized such model^{11, 17}. Nurses and midwives, who make regular contacts with women have been suggested as ideal personnel to carry out such examinations¹⁶.

Although known to be relatively inexpensive without any requirement for technology, a CBE screening program will nevertheless require funding for training and other running costs. The relatively lower cost compared to other more expensive technology dependent screening modalities may however serve as a basis for lobbying policy makers to incorporate it into the Health Insurance Scheme in countries where such programs exist.

The success of any screening program ultimately depends on the number of women who eventually get treated among those who screen positive. This can be enhanced by developing an effective referral system for diagnosis and treatment. A very encouraging treatment completion rate of 92% was observed in a randomized controlled trial of breast and cervix cancer screening in India where such referral system was in place¹¹. The concept of patient navigation which was first described by Harry Freeman in 1990 in the United States has also continued to find more relevance in promoting prompt diagnosis and treatment of screen positive women. It is a patient-centered health-care service delivery model that assists individuals, particularly the medically underserved,

in overcoming personal, logistical, and system barriers to care across the cancer care continuum^{18, 19}. A similar concept may also be of benefit in low and middle income countries where access to health care constitutes a challenge.

The role of the media also features prominently in this study as an important means of creating awareness. Its wide coverage and the peculiar advantage of reaching those who do not regularly visit hospitals makes it a very attractive medium for creating breast cancer awareness. The various social and religious platforms that allows for information sharing also provide additional opportunities for advocacy which should be explored.

The breast being a private area of the body, and the fact that there are various social, religious and cultural considerations that must be considered when planning interventional programs, it is important to seek the opinion of the target population about such interventions and about possible obstacles. This is particularly important as approximately 99% of women ascribed to some religious affiliation. It is encouraging that more than two thirds of the respondents are willing to have regular breast examination. Responses from those who declined such examination suggests that with proper education and enlightenment, many more are likely to be won over, given that the reasons for non-willingness border on lack of perceived need for the test. Such perceptions are probably based on the misconception of the essence of screening, as a test meant only for those who know they have the disease. It should therefore not be assumed that the concept of screening is clearly understood by all, and should feature prominently during public enlightenment campaigns.

Bearing in mind the impact of culture and religion on such an intervention, we sought to know if there are preferences for the gender of the examiner. It is quite interesting to note that the majority do not care about the gender of the examiner as long as competence is guaranteed. This was the case irrespective of age group, level of

education or religion. This finding was also observed in a study from Southern Nigeria which evaluated, amongst other things the impact of gender of the examiner on breast screening practices²⁰. This finding may however not be generalizable bearing in mind the concept of hidden socio-cultural and religious barriers. As such, it is recommended that early detection programs be implemented alongside educational programs which aid acceptance, coupled with modifications that are culturally appropriate to the region²¹.

From the foregoing, the number of women who visit hospitals for various health challenges allowing opportunities for contact with a trained health personnel, provides a great opportunity for breast cancer advocacy and screening. A hospital based screening programme can therefore be designed to target such groups. Even if the detection rate is low, minimal resources would be expended, while awareness would have been created. Those who do not visit hospitals regularly, who constitute the minority of the women studied, may then be reached through community outreach programs.

The willingness of women to have a breast examination without much social concerns and the negligible cost of CBE, altogether make a carefully designed programme look promising. In addition to creating an opportunity for early detection, it also serves as a means of improving the general health seeking behavior of the populace which certainly creates the necessary ground work for optimal utilization of standard screening modalities and facilities when they become widely available.

In conclusion, our findings show that current CBE practice though poor, is acceptable to the majority of women in the studied population with few social concerns. Awareness creation with educational programs are needed to correct erroneous perceptions about breast cancer and the need for screening

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APPENDIX

SURVEY INSTRUMENT

BREAST SCREENING PRACTICES IN NIGERIA

We are asking for your permission for participation in a survey on breast cancer screening. Please answer the following questions.

Where do you live? (Please check one): **Ile-Ife** ☐ **Iwo** ☐

**SECTION A: GENERAL KNOWLEDGE AND EXPERIENCE ABOUT
BREAST CANCER**

1. Have you ever heard of breast cancer?
a. Yes ☐ b. No ☐
2. Do you know anyone who has had breast cancer?
a. Yes ☐ b. No ☐
3. What was your relationship with the person? _____
4. Did the person receive medical treatment?
a. Yes ☐ b. No ☐ c. Don't know ☐
5. What was the outcome in that person?
a. Alive and well ☐
b. Alive but sick ☐
c. Don't know ☐
d. Not applicable ☐
6. Do you think breast cancer is curable?

- a. Yes ☐ b. No ☐ c. Don't know ☐

7. Do you think breast cancer can be cured medically?

- a. Yes ☐ b. No ☐ c. Don't know ☐

(If No, Please state the method of treatment you think offers cure)

8. Do you think breast cancer can be detected early?

- a. Yes ☐ b. No ☐

9. Has anyone ever recommended any method of early detection to you? (Mention who)

- a. Yes ☐ b. No ☐

10. Please mention the methods of early detection you are aware of:

SECTION B: MAMMOGRAPHY

11. Have you ever heard of mammography?

- a. Yes ☐ b. No ☐

12. What is mammography?

- a. It is a blood test ☐
b. It is a urine test ☐
c. It is a form of X-ray of breast ☐
d. Don't know ☐

13. Who should have mammography?

- a. Teenage girls ☐
b. Women in their twenties ☐
c. Women in their thirties ☐
d. Women forty years and above ☐

- e. Only elderly women ☐
- f. Don't know ☐

14. How frequently should mammography be done?

- a. Once in a life time ☐
- b. Every 1 to 2 years ☐
- c. Once in 5 years ☐
- d. Every 10 years ☐
- e. Don't know ☐

15. Do you know where mammography can be done in your town?

- a. Yes ☐
- b. No ☐
- c. Don't know ☐

16. How much does mammography cost?

- a. <5,000 ☐
- b. 5,000-10,000 ☐
- c. >10,000 Naira ☐
- d. Don't know ☐

17. If the test were recommended for you as a means of preventing death from breast cancer, what is the maximum amount you can afford once a year to do the test?

18. When did you last have mammography?

- a. <1 year ☐
- b. 1-2 years ☐
- c. >2 years ☐
- d. Never ☐

19. What would you say is/are the reason(s) why you have not had a mammography before?

- a. Don't know about the test ☐

- b. Don't know where to do the test ☐
- c. Nobody has told me the importance of the test ☐
- d. Difficult to get an appointment ☐
- e. I don't have the money to do the test ☐
- f. Too busy to do the test ☐
- g. Feel embarrassed to do the test ☐
- h. Worried about what the test might show ☐
- i. Don't think I need the test ☐
- j. Others (please specify)

20. Which of these is the most important reason why you have not had mammography?

SECTION C: CLINICAL BREAST EXAMINATION

21. Have you ever had your breast examined by a health practitioner?

- a. Yes ☐
- b. No ☐

22. When was the last time you had such examination?

- a. <6months ☐
- b. 6-12 months ☐
- c. 1-2 years ☐
- d. >2 years ☐
- e. Never ☐

23. If recommended as a means of early detection and prevention of unnecessary death from breast cancer, will you be willingly to have a health practitioner examine your breast once in 6 months?

- a. Yes ☐ b. No ☐

24. If No why? _____

25. Who will you prefer to examine you?

- a. Male practitioner ☐ b. Female practitioner ☐ c. Don't care about the gender ☐

SECTION D: SELF BREAST EXAMINATION AND OTHER HEALTH BEHAVIOURS

26. How regularly do you examine your breasts?

- a. At least once a month ☐ b. At Once in 2-6 months ☐ c. Once in 7-12 months ☐ d. Rarely ☐ e. Never ☐

27. Where do you commonly receive treatment when you have health challenges?

- a. Traditional healers ☐
b. Patent medicine stores ☐
c. Hospitals ☐
d. Self-medication ☐
e. Others (please specify)

28. Which of the following tests have you ever done?

- a. Pap smear ☐
b. Blood sugar test ☐

**SECTION E: PLEASE GIVE US A LITTLE INFORMATION ABOUT
YOURSELF**

29. Please tell us your age: _____

30. What is your marital status?

a. Married ☐ b. Single ☐ c. Widowed ☐ d. Separated ☐

31. Which of the following best describes your level of education

- a. None ☐
- b. Primary ☐
- c. Secondary ☐
- d. College graduate ☐

32. Which of the following best describes the level of education of your husband?

- a. None ☐
- b. Primary ☐
- c. Secondary ☐
- d. College graduate ☐
- e. Not applicable ☐

33. What is your occupation?

- a. Farming ☐
- b. Trading ☐
- c. Teaching/Lecturing ☐
- d. Government employee ☐
- e. Artisan ☐
- f. Others(Please specify) _____

34. What is the occupation of your husband?

- a. Farming ☐
- b. Trading ☐
- c. Teaching/Lecturing ☐
- d. Government employee ☐
- e. Artisan ☐
- f. Others (Please specify) _____

35. What is your religion?

- a. Christianity
- b. Islam
- c. Traditional worship
- d. Others (Please specify)

Thank you for participating in this study.